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AUTHOR McConnell, Scott; McEvoy, Mary; Carta, Judith J.; Greenwood, Charles R.; Kaminski, Ruth; Good, Roland H., III; Shinn, Mark; Ysseldyke, James; Goldberg, Paula

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ABSTRACT

This document reports on development of a comprehensive system for measuring the ongoing development of children with disabilities from birth to age 8. A multi-step process was used to identify a set of general growth outcomes for children in this age range and to begin formulating individualized indicators of growth and development, as well as additional assessment tools. A set of 15 outcomes was identified spanning the scope of developmental competencies usually associated with early childhood education; i.e., communication, motor, social, adaptive, and cognitive domains. Validation of these outcomes was established through a national survey of parents of children with and without disabilities, and professionals in early childhood and early elementary education. The final set of general growth outcomes is organized around the following goals: (1) the child uses language to convey and comprehend communication and social intent; (2) the child takes responsibility for his/her behavior, health, and well-being, even in the face of challenge or adversity; (3) the child negotiates and manipulates the environment; (4) the child initiates, responds to, and maintains positive social relationships; and (5) the child uses cognitive skills to explore the environment, reason, and solve problems. (Contains 17 references.) (DB)

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EARLY CHILDHOOD RESEARCH INSTITUTE
ON

MEASURING GROWTH & DEVELOPMENT

TECHNICAL REPORT # 2

SELECTION OF GENERAL GROWTH OUTCOMES FOR CHILDREN BETWEEN BIRTH AND AGE EIGHT

EC 308393

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JUNE, 1998

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For more information, contact the Early Childhood Research Institute on Measuring Growth and Development, University of Minnesota, 202 Pattee Hall, 150 Pillsbury Drive S.E., Minneapolis, MN 55455 (Phone: 612-624-8020, Fax: 612-625-2093, Email: pries005@umn.edu).

A Collaborative Effort

Scott McConnell & Mary McEvoy
Center on Early Education and Development
Institute on Community Integration
University of Minnesota

Judith J. Carta & Charles R. Greenwood
Juniper Gardens Children's Project
University of Kansas

Ruth Kaminski, Roland H. Good III, & Mark Shinn
Center on Human Development
University of Oregon

with assistance from

James Ysseldyke
National Center on Educational Outcomes
University of Minnesota

Paula Goldberg
PACER, Inc.
Minneapolis, Minnesota

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Abstract

Investigators of the *Early Childhood Research Institute on Measuring Growth and Development* initiated this project to create a comprehensive system for measuring the ongoing development of children with disabilities from birth to age eight. To begin formulating individualized indicators of growth and development, as well as additional assessment tools, they relied on a multi-step process to identify a set of general growth outcomes for children in this age range. At the conclusion of this process, they selected a set of 15 outcomes spanning the scope of developmental competencies usually associated with early childhood education, i.e., communication, motor, social, adaptive, and cognitive domains. Investigators sought validation of these outcomes through a survey of nationally drawn samples of parents of children with and without disabilities, and professionals in early childhood and early elementary education.

Background

In the spring of 1996, researchers at the Universities of Minnesota, Kansas, and Oregon responded to a request for a research proposal from the Office of Special Education and Rehabilitation Services (OSERS) of the U.S. Department of Education. The federal request called for the creation of a comprehensive system for measuring the developmental performance of children with disabilities from birth to age eight, and their families. Staff at OSERS stipulated:

> The performance measurement system will consist of child and family outcomes for different child ages within the early childhood age range as well as indicators and sources of data corresponding to each outcome. These child and family outcomes, indicators, and sources of data must be useful for tracking the progress of a broad range of children and families with different disabilities and characteristics and for measuring the impact and effectiveness of early childhood programs (RFP 84.024S[3]).

In response to this request, investigators at the three universities proposed to develop two sets of outcomes: (a) common competencies applicable to all children between birth and age eight, and their families; and (b) a set of subgroup specific outcomes for any subsets of children and families for whom the general outcomes did not describe development adequately.

In late October, 1996, soon after the Institute began formal implementation of the proposal, all of the principal investigators gathered in Minneapolis/St. Paul, MN to review work scope and plan strategy. We met with Drs. Stanley Deno and James Ysseldyke, two researchers at the University of Minnesota, who reviewed the theoretical orientation of the Institute and its initial goals. As a result of these meetings, as well as contact between principal investigators and staff at OSERS, we arrived at two conclusions. First, given the substantial body of extant theoretical and empirical work on developmental outcomes for young children and their families, we concluded any *new* analyses would likely *replicate* previous ones. We decided to rely on existing sources of knowledge to begin selecting and validating outcomes as the foundation for development of a comprehensive measurement system. Second, we initially proposed to bring individuals together across early childhood constituency groups to select general growth outcomes using consensus-building techniques. However, we discovered previous consensus-building efforts on early childhood outcomes across a variety of "stakeholder" groups yielded high levels of agreement, regardless of group composition, geographical location, or cultural perspective. Thus, efforts to organize meetings between constituencies to build consensus on such outcomes seemed redundant and a poor use of our valuable resources. Instead, we turned our attention to a comprehensive review and synthesis of existing outcome statements.

Selection of Qualifying Criteria

We set the following criteria for selecting prospective outcome statements for children between birth and age eight: (a) individualized focus; (b) comprehensiveness across developmental domains; and (c) continuity across age.

Most existing outcome systems for young children focus on aggregated results for groups of children (see *Technical Report #1: Accountability Systems for Children Between Birth and Age Eight* for a more detailed discussion of outcome systems for young children). For example, to measure progress toward Goal 1 of the National Education Goals (i.e., By the year 2000, all children in America will start school ready to learn), governmental agencies generally report nomothetic statistics, such as the percentage of children born with one or more health risks or the percentage of preschoolers whose parents read to them (Federal Interagency Forum on Child and Family Statistics, 1997; National Education Goals Panel, 1995). Likewise, the National Center on Educational Outcomes (NCEO) recommends using frequencies of children and families who demonstrate certain practices or skills (e.g., percent of chil-

dren who initiate and follow through on activities) or who participate in certain activities and environments (e.g., percent of children enrolled in early care and education programs) as the sole criteria for establishing indicators of outcomes for young children (Ysseldyke, Thurlow, & Gilman, 1993a; Ysseldyke, Thurlow, & Gilman, 1993b).

While nomothetic statistics provide important information about early childhood programs, they do not help educators evaluate an *individual* child's developmental trajectory nor begin to fashion interventions specific to the child's needs if her trajectory fails to meet expectations. In response, we planned to select and refine outcomes to describe individual children's growth and development. By focusing on individual children, we believe these outcomes will serve as the foundation for creation of indicators early childhood educators can use to track the developmental progress of individual children, especially children with disabilities, as well as drive creation of additional solutions-oriented assessment tools for educators to employ when an individual child's progress fails to meet predetermined expectations. Thus, an essential feature of our focus on individualized outcomes rests on the consequential validity of these statements.

From the outset, we planned to include outcomes across the range of developmental skills typically expected of children between birth and age eight. These include skills in language and communication, cognitive, motor, social, and adaptive (or, activities of daily living) domains. While we expected to include outcomes across all of these developmental domains, we did not necessarily plan on labeling outcomes using these traditional domain headings, focusing more on the functional aspects of statements.

We also hoped to use a common set of outcomes across the entire age range of children upon whom the Institute will focus, i.e., birth to age eight. We realized specific milestones for an infant or toddler will differ markedly from skills expected of a five-year-old or eight-year-old child. For example, we expect most preschoolers will produce words and sentences as an outcome of their communication development (Brown, 1973; Wells, 1985), in contrast to preverbal infants who rely more on joint attention, gestures, and sounds to communicate (Wetherby & Prizant, 1992). However, we believed it possible to maintain the functional continuity of outcomes within each developmental domain and across age to a significant extent, allowing Institute staff and others to apply an initial set of broad outcomes to all children between birth and age eight. Thus, while infants, preschoolers, and early elementary-aged children may engage in different behaviors to communicate, in both cases they indicate their wants and needs and express meaning to others.

In light of these interests, we decided to pursue the following action steps to generate an initial set of outcomes. *First,* we would identify sets of prospective outcomes by examining existing resources, focusing on reviews of literature and extant assessment instruments. Given the volume of resources on the topic of developmental outcomes in early childhood, the relative consensus across early childhood "stakeholders," and the accumulated experience of the Institute's principal investigators in the field of early childhood assessment and intervention, we believed these initial efforts could be based on a relatively targeted set of resources.

Second, we wanted to select a comprehensive but parsimonious list of outcomes for each of three age groups (birth-two-year-olds, three-to-five-year-olds, and five-to-eight-year-olds), paying particular attention to the terminal ages of these groups (i.e., children at ages three, five, and eight). We intended to accomplish this step by aggregating statements of developmental skills from existing resources and following an inductive process to determine broader outcomes, using constant comparative methods described in Lincoln and Guba (1985).

Third, we planned to review broad outcomes developed *within* each age group for their applicability *across* the three age groups. Staff at each Institute site would create a table of outcomes appropriate for children within their assigned age range, and then review this table with the two other sites. In reviewing these tables, we planned on paying particular attention to the consequential and social validity of prospective outcomes across all children between birth and age eight. That is, we felt two of the most important standards to heed centered on: (a) the impact of outcomes on understanding and enhancing developmental trajectories of young children with and without disabilities; and (b) how early childhood constituencies would perceive the appropriateness and usefulness of these outcomes. We realized future use of the general growth outcomes would hinge greatly on acceptance by families, teachers, administrators, and other individuals involved in early childhood education.

To assess the extent to which our outcomes were indeed acceptable to parents, teachers, and others, we planned to conduct a national survey of parents and early childhood/early elementary professionals, asking them to rate each of the general growth outcomes and provide revised outcomes if they wished. Results from this survey (described in *Technical Report #3: National Survey to Validate General Growth Outcomes for Children Between Birth and Age Eight*) generated validating feedback on selected outcomes, as well as provided information on the need to adapt outcomes for specific subgroups of young children.

Initial Selection of Outcomes at Institute Sites

In general, staff at all Institute sites used the guiding principles described above for the selection of general growth outcomes. However, each site approached the task in slightly different ways. This section details how staff at each site derived initial outcome statements for their particular age group.

Infant and toddler outcomes, Juniper Gardens Children's Project. Staff at the Juniper Gardens Children's Project, University of Kansas, developed outcomes for children between birth and age three. At first, they examined assessment instruments, lists of developmental milestones, early childhood curricula, journal articles, and book chapters. Examples included the *Battelle Developmental Inventory* (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984), *AEPS Measurement for Three to Six Years* (Bricker & Pretti-Frontczak, 1996), *Developmentally Appropriate Practice in Early Childhood Programs (Revised Edition)* (Bredekamp & Copple, 1997), *The MacArthur Communicative Development Inventories* (Fenson et al., 1993), and *From First Words to Grammar: Individual Differences and Dissociable Mechanisms* (Bates, Bretherton, & Snyder, 1988).[1]

Using developmental "areas" formulated by the authors of the *Battelle Developmental Inventory* (Newborg et al., 1984) (e.g., peer/adult interaction and self-concept within the Personal-Social domain), Juniper Gardens staff assigned each of the skills they found to one or more of these areas. Once they had assigned all skills to areas, they discussed ways of converting area labels into outcome statements. They focused especially on areas that met our pre-determined criterion of consequential validity. Once they decided on an outcome statement, they strove to draft it in terms understandable to a broad range of consumers, including families.

As Juniper Gardens staff developed lists of skills, areas, and domains, they noticed they could channel their work into two different directions. They could draft outcomes to represent what children could perform *at the end* of their age range (i.e., competencies achievable by three-year-olds, such as using multi-word utterances to express meaning to others) or what children *in the entire range* of birth to age three could perform in *varying degrees* (e.g., using gestures, sounds, words, and word combinations to express meaning to others). All project staff discussed this point and decided to focus on outcomes covering the entire age range (a *partial attainment* model) rather than just the end point (a

[1]For more information on resources used to develop outcomes, contact the *Early Childhood Research Institute on Measuring Growth and Development.*

terminal skill model), emphasizing change in a developmental skill over time (i.e., growth) rather than on the attainment of a particular skill at the end of a sequence. At the same time, though, Juniper Gardens staff paid attention to skills expected of a three-year-old child as a boundary on typical, age-appropriate skills. Staff at the other two project sites adopted this strategy as well.

The Juniper Gardens review of skills and assignment to developmental areas generated a list of 22 outcome statements. Appendix A shows this list of outcomes.

Preschool outcomes, University of Minnesota. Staff at the University of Minnesota developed outcomes for children between three- and five-years-old. In similar fashion as Juniper Gardens staff, they conducted focused reviews of assessment materials and other literature to identify existing statements of age-appropriate outcomes. They divided resources into two kinds: (a) "known resources," including many of the same instruments used by Juniper Gardens staff, as well as documents produced by the National Center on Educational Outcomes (Seppanen, Schaeffer, & Julian, 1995; Ysseldyke et al., 1993b) and states with detailed outcomes for young children (e.g., Maryland Commission on the Early Learning Years, 1992); and (b) "found resources," i.e., journal articles, reports, and related documents discovered through searches of three on-line databases: ERIC, PSYCINFO, and ORBIT (a library database maintained by staff of the National Center on Educational Outcomes at the University of Minnesota). Specifically, they searched for empirical studies, reviews of studies, and statements of expected or desired outcomes by political entities (e.g., state departments of education). They used the following search terms in various combinations to explore these databases: preschool children, outcome, goal, norm, developmental stages, early childhood, child development, pre-kindergarten, and five-year-old. They stipulated such resources must focus on one or more of the five developmental domains of interest (preferably including a comprehensive and detailed discussion of skills within all five domains), be issued since 1977, and published in English. They developed a literature coding form to assist graduate research assistants with their review of a resource's appropriateness and essential information to gather from such literature.[2]

Staff at the University of Minnesota combined developmental skills from all resources to generate 819 outcomes, grouped by domain and developmental area (patterned after the process followed by Juniper Gardens staff). Relying on the constant comparative method described by Lincoln and Guba

[2]For more information on resources used to develop outcomes, contact the *Early Childhood Research Institute on Measuring Growth and Development.*

(1985) [based on their restatement of techniques formulated by Glaser and Strauss (1967)], teams of three individuals evaluated each skill in a developmental area and created categories of outcomes based on similarities between skills. They limited the number of prospective categories per developmental domain, setting a maximum of three. Then, individual staff members redrafted more comprehensive outcome statements, broadening the scope of categories rather than eliminating content from the final set of outcomes. In this way, they wished to maintain *parsimony* of the ultimate set of outcomes selected while at the same time retain the *scope* of developmental domains (Lincoln & Guba, 1985).

Next, Minnesota staff conducted a process of team categorizing (Lincoln & Guba, 1985) to reach consensus on the outcome statements fashioned from the original set of 819 skills. At group meetings, they discussed categories in which each person had assigned each of the skills. They let categorical overlap across staff and forced assignment of "miscellaneous" skills to categories drive the final selection of outcome statements within each developmental domain. Finally, they conducted a "member check" (Lincoln & Guba, 1985) on the list of outcome statements by asking each person to repeat the process of assigning skills to categories generated by group consensus, looking especially for skills that could not be placed within a category.

In similar fashion to Juniper Gardens staff, University of Minnesota personnel formulated outcome statements to describe the developmental growth of all children within the age range of three- to five-years-old. They finished the task with a list of 13 outcomes. Appendix A shows this list of outcomes.

Early elementary outcomes, University of Oregon. The team at the University of Oregon developed outcomes for children between five- and eight-years-old. They initiated their work by consulting a text on child development (Sroufe, Cooper, & DeHart, 1992), as well as many of the same resources used by staff at Juniper Gardens and the University of Minnesota.[3] They modeled their work after the process followed by staff at Juniper Gardens, drafting one outcome statement for each selected developmental area within each domain. Their selection of developmental areas depended on project-wide criteria, i.e., whether or not outcomes crafted from developmental areas would be observable, measurable, show child change over time, and be amenable to intervention.

[3]For more information on resources used to develop outcomes, contact the *Early Childhood Research Institute on Measuring Growth and Development.*

Staff at the University of Oregon fashioned 17 outcomes for children between ages five and eight, heavily weighted toward the cognitive domain. Since this age range represents the period of time when children attend their first three years of elementary school, the emphasis on cognitive (or, academic) skills seemed reasonable. They also asserted the phrase "friendship networks" may encompass the developmental issues of children in this age group more appropriately than "social interaction." Appendix A shows their list of outcomes.

Group Selection of Final Set of General Growth Outcomes

In June, 1997, the project's principal investigators from all three sites gathered to discuss work accomplished at each site on the selection of outcomes and to condense information into a final set. We identified general concerns about the statements fashioned at each site. We considered the vagueness of some statements, the lack of measurability over time in some instances, and the issue of ensuring linkages across the three age groups. We discussed how to present the concept of academic development of children between birth and age five to professionals and families who view this area as the exclusive domain of elementary school and beyond, as well as how to maintain focus on concepts of child development for children between the ages of five and eight.

Investigators also focused on crafting outcomes using language accessible to the widest possible audience, striving to simplify the wording of outcomes without losing substantive information. We partially solved this dilemma by focusing on functional aspects of developmental domains (i.e., a child's behavior across domains and settings) rather than emphasizing skills in isolation within domains. Thus, while the final set of general growth outcomes somewhat corresponds to a traditional list of five developmental domains in number and basic content, the functional nature of these outcomes differs markedly from tradition.

As an additional result of this analysis, investigators from all three sites noted the commonality across the three age-based sets of general outcomes. Using criteria developed at the beginning of our review (i.e., parsimonious but comprehensive list of outcomes for partial attainment assessment) and those developed during our collective review (i.e., functional, widely accessible language), we derived a composite list of 15 outcome statements that reflected the full content of *each* age-based effort.

Appendix B shows the five superordinate outcomes and 15 general growth outcomes crafted by investigators to describe all children's development between birth and age eight. After completing this list, investigators distributed it to project staff and other individuals with no project affiliation to educe feedback on the understandability of outcomes for the widest possible audience. This review process led to drafting two versions of outcomes, one for professionals and one for families. In turn, these two sets of outcomes became the basis of a national survey conducted by project staff, in conjunction with the Minnesota Center for Survey Research at the University of Minnesota, to elicit feedback from a nationally drawn sample of families and professionals in early childhood and early elementary education. Information from this survey helped us validate these general growth outcomes across all children, as well as provided information about the need to adapt outcomes to describe certain subgroups of children for whom these outcomes failed to characterize development adequately (see *Technical Report #3: National Survey to Validate General Growth Outcomes for Children Between Birth and Age Eight*).

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Appendix A

Initial Selection of Outcomes at Institute Sites

Juniper Gardens Children's Project: Outcomes for children between birth and age three

- Social:
  - Child is able to initiate, respond to initiations from, and maintain positive social interactions with significant adults (e.g., parents, caregivers, teachers).
  - Child is able to initiate, respond to initiations from, and maintain positive social interactions with peers.
  - Child demonstrates and maintains positive social expression and affect.
  - Child demonstrates pretend play behavior given appropriate social situations.
  - Child demonstrates essential aspects of social knowledge including own name, sex, address, and use of social amenities.

- Cognitive:
  - Child understands relational concepts including those that are quantitative, directional, and positional and can discriminate items that are functionally related.
  - Child demonstrates persistence and responsiveness to specific events.
  - Child recalls events that occurred on the same day and can recall verbal sequences such as routines, numbers and nursery rhymes without contextual cues.
  - Child makes statements and/or appropriately answers questions that require reasoning and problem solving about objects, concepts, situation, or people.

- Child interacts appropriately with real age-appropriate objects and will carry out pretend activities with imaginary objects.
- Child will repeat unfamiliar actions and words.

- **Communication:**
  - Child uses gestures, sounds, words, and word combinations to express meaning to others.
  - Child uses gestures, sounds, words or word combinations to initiate or maintain interactions with others (e.g., turn-taking).
  - Child responds to others' communication with appropriate gestures, sounds, words, or word combinations.
  - Child indicates comprehension of single words and longer utterances.

- Motor:
  - Child demonstrates functional use of hands or fingers to manipulate objects or toys.
  - Child demonstrates pre-handwriting skills such as copying shapes and letters.
  - Child is able to walk and run with balance and coordination.
  - Child demonstrates coordination while engaged with play equipment such as balls, riding toys or outside play equipment.

- **Adaptive:**
  - Child can complete typical toileting routine with minimal assistance.
  - Child can feed self and participate in mealtime routines with minimal assistance.
  - Child can follow home and child care directions, rules, and routines.

University of Minnesota: Outcomes for children between three- and five-years-old

- **Communication:**
  - Child will engage in communicative/conversational interactions with others, usually involving reciprocal exchange of words and language; social, dyadic interchange; use of social conventions; and employment of language to manipulate or obtain resources from others in the environment.
  - Child will communicate using typical rules and patterns of language, intelligible articulation, and correct word use and syntax, at the level of both individual words and phrases/sentences.
  - Child will communicate with fluency, labeling ideas and actions in words, sentences, and paragraphs, focusing on vocabulary, utterance length, and nonsocial applications of language.
- **Adaptive:**
  - Child will demonstrate a range of basic, self-help/care, survival skills, including (but not limited to) skills in dressing, eating, toileting/hygiene, and safety/identification.

- Child will demonstrate responsibility by meeting the behavioral demands of home, school, and community settings (i.e., behavior in response to directions/authority of others, often group-referenced).
- Child will demonstrate independence through self-initiated/directed behavior, even in the face of adversity (i.e., persistence).

- **Social/Emotional**:
  - Child will interact with peers and adults, maintaining social relationships and demonstrating social participation in play.
  - Child will demonstrate appropriate assertion, affect, and problem-solving skills in his/her interactions with others (i.e., absence of challenging behavior).
  - Child will demonstrate self-awareness and appropriate social affect.

- **Cognitive**:
  - Child will demonstrate a conceptual and practical understanding of early literacy and math skills.
  - Child will demonstrate logical reasoning and problem-solving skills.

- **Motor**:
  - Child will use his/her large muscle system in a coordinated manner to negotiate the environment.
  - Child will use her/his hand muscle system in a coordinated manner to negotiate and manipulate the environment, as well as communicate with others (i.e., early writing skills).

University of Oregon: Outcomes for children between five- and eight-years-old

- Cognitive:
  - Child can solve simple problems using conservation and classification skills.
  - Child can retain 5 chunks of information using mnemonic strategies.
  - Child can understand number and time concepts.
  - Child can demonstrate knowledge of age-appropriate information.
  - Child can read and comprehend a variety of printed material.
  - Child uses writing as a tool to learn, reflect and communicate for a variety of audiences and purposes.
  - Child demonstrates understanding of age-appropriate mathematical concepts.
- Communication:
  - Child can use complex sentences to serve a variety of communicative purposes.
  - Child can comprehend communicative intent of others.
  - Child can use language to convey communicative and social intent (e.g., feelings, information, etc.).
- Adaptive:
  - Child can take care of personal hygiene and eating independently.
  - Child demonstrates use of basic household tools competently.
  - Child can state personal information and follow basic societal rules.

- **Motor**:
  - Child demonstrates gross motor control to accomplish greater coordination in space.
  - Child demonstrates fine motor control to accomplish age-appropriate activities.
- **Social/Emotional**:
  - Child demonstrates social skills necessary to develop and maintain stable friendships.
  - Child demonstrates ability to manage behavior in socially acceptable ways.

Appendix B

Final Set of General Growth Outcomes

The child uses language to convey and comprehend communicative and social intent.

- Child uses gestures, sounds, words, or sentences to convey wants and needs or to express meaning to others
- Child responds to others' communication with appropriate gestures, sounds, words, or word combinations
- Child uses gestures, sounds, words, or sentences to initiate, respond to, or maintain reciprocal interactions with others

The child takes responsibility for his/her behavior, health, and well-being, even in the face of challenge or adversity.

- Child engages in a range of basic self-help skills, including but not limited to skills in dressing, eating, toileting/hygiene and safety/identification
- Child meets behavioral expectations (such as following directions, rules, and routines) in home, school, and community settings
- Child appropriately varies or continues behavior to achieve desired goals

The child negotiates and manipulates the environment.

- Child moves in a fluent and coordinated manner to play and participate in home, school, and community settings.

- Child manipulates toys, materials, and objects in a fluent and coordinated manner to play and participate in home, school, and community settings

The child initiates, responds to, and maintains positive social relationships.

- Child interacts with peers and adults, maintaining social interactions and participating socially in home, school, and community settings.
- Child appropriately solves problems in his/her interactions with others.
- Child shows affect appropriate to the social context.

The child uses cognitive skills to explore the environment, reason, and solve problems.

- Child demonstrates an understanding of age-appropriate information.
- Child demonstrates recall of verbal and non-verbal events.
- Child understands and uses concepts related to early literacy and math skills.
- Child solves problems that require reasoning about objects, concepts, situations, and people.